

FIG. 1

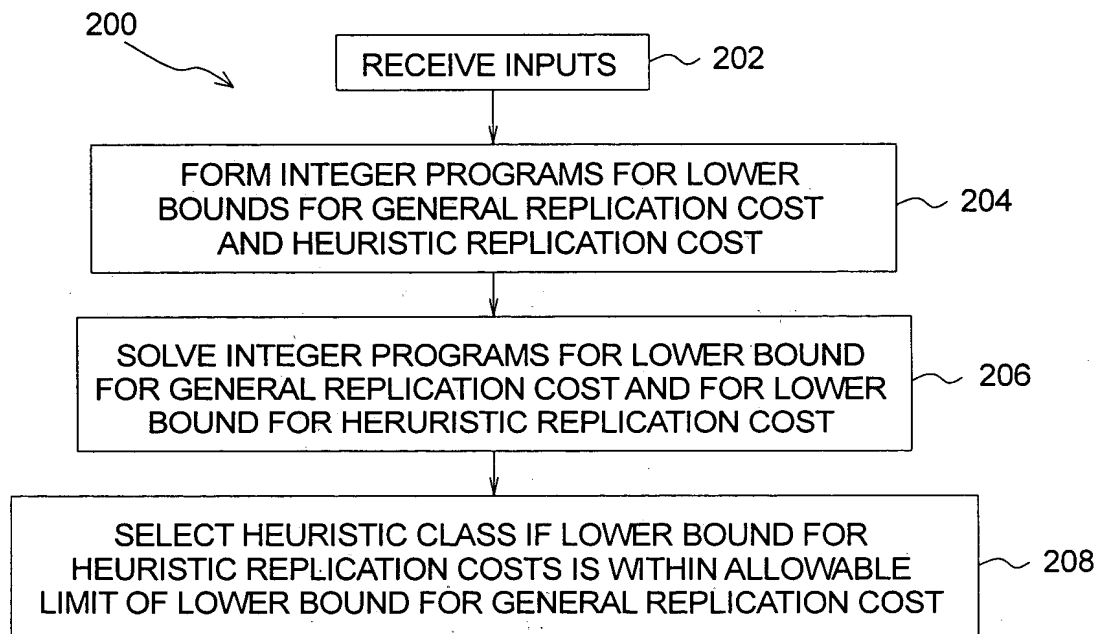


FIG. 2

Table 1		
Variable	Type	Description
$store_{nik}$	Binary	$n$ th node stores $k$ th data object during $i$ th interval
$create_{nik}$	Binary	$k$ th data object created on $n$ th node during $i$ th interval
$covered_{nik}$	Binary	$n$ th node can access $k$ th data object w/in latency threshold during $i$ th interval
$open_n$	Binary	$n$ th node is enabled; it can store replicas and run data placement heuristics

FIG. 3

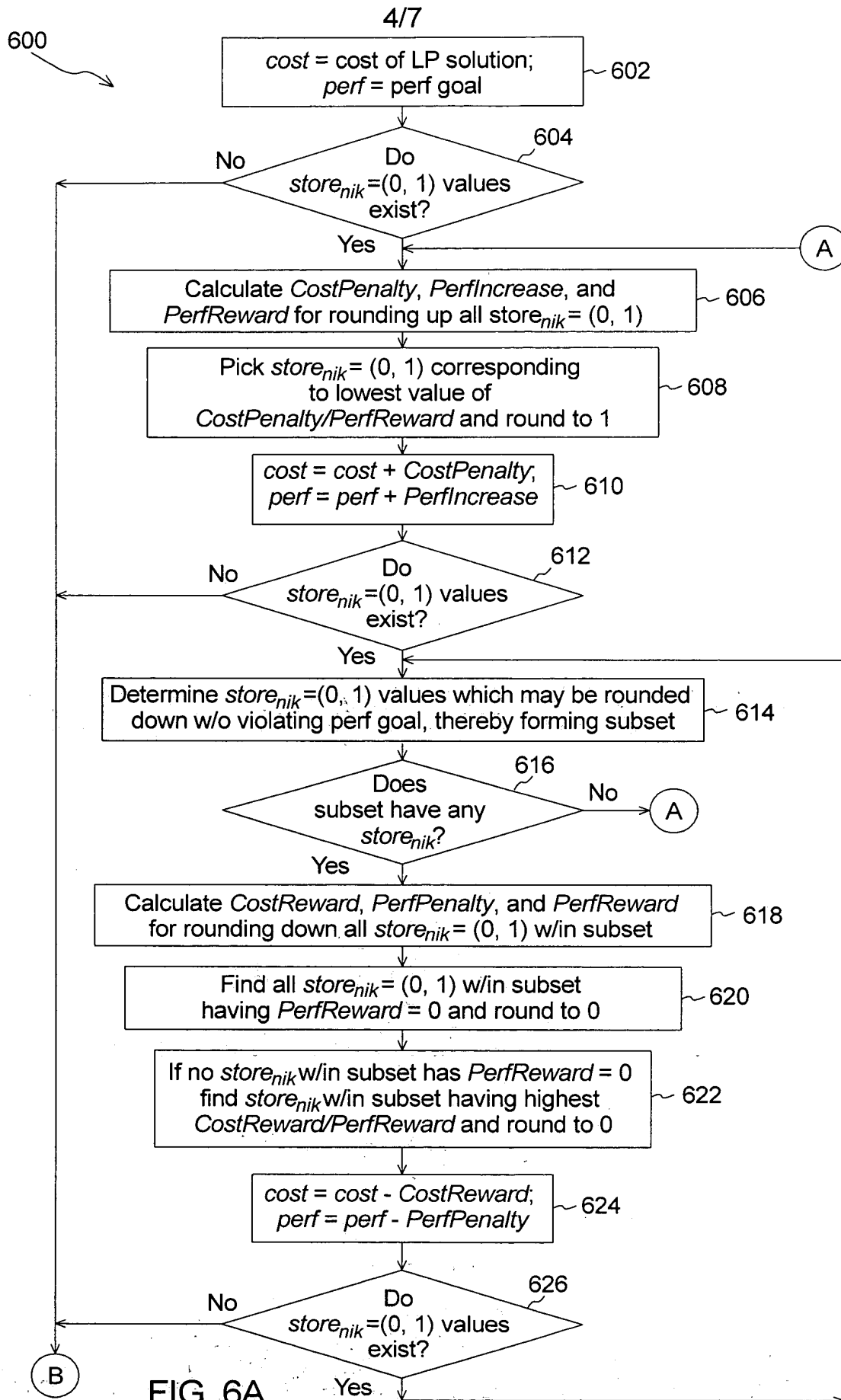
Table 2		
Variable	Type	Description
$read_{nik}$	Integer	Number of read requests from $n$ th node for $k$ th data object during $i$ th interval
$write_{nik}$	Integer	Number of write requests from $n$ th node for $k$ th data object during $i$ th interval
$latency_{nm}$	Real	Data access latency for accessing an object $a$ th $m$ th node from $n$ th node
$dist_{nm}$	Binary	$n$ th node can access $m$ th node within latency threshold
$know_{nm}$	Binary	$n$ th node uses information from $m$ th node to make placement decision
$fetch_{nm}$	Binary	$n$ th node can fetch data objects from $m$ th node
$hist_{nik}$	Binary	$n$ th node has a record in its activity history of $k$ th data object being accessed on $n$ th node during $i$ th interval
$T_{lat}$	Real	Target latency threshold
$T_{qos}$	Real	Specified ratio of accesses served within latency threshold
$\alpha$	Integer	Unit cost for storage
$\beta$	Integer	Unit cost for replica creation
$\gamma$	Integer	Unit cost penalty for an access exceeding latency threshold
$\delta$	Integer	Unit cost for an update message
$\zeta$	Integer	Unit cost for enabling and managing a node

FIG. 4

Table 3

Heuristic class	Heuristic properties					
	Storage constraint	Replica constraint	route	know	hist	Reactive constraint
Storage constrained heuristics	x		global	global	multi	
Replica constrained heuristics		x	global	global	multi	
Decentralized storage constrained heuristics w/ local routing	x		local	local	multi	
Local caching	x		local	local	single	x
Cooperative caching	x		global	global	single	x
Local caching w/ prefetching	x		local	local	single	
Cooperative caching w/ prefetching	x		global	global	single	

FIG. 5



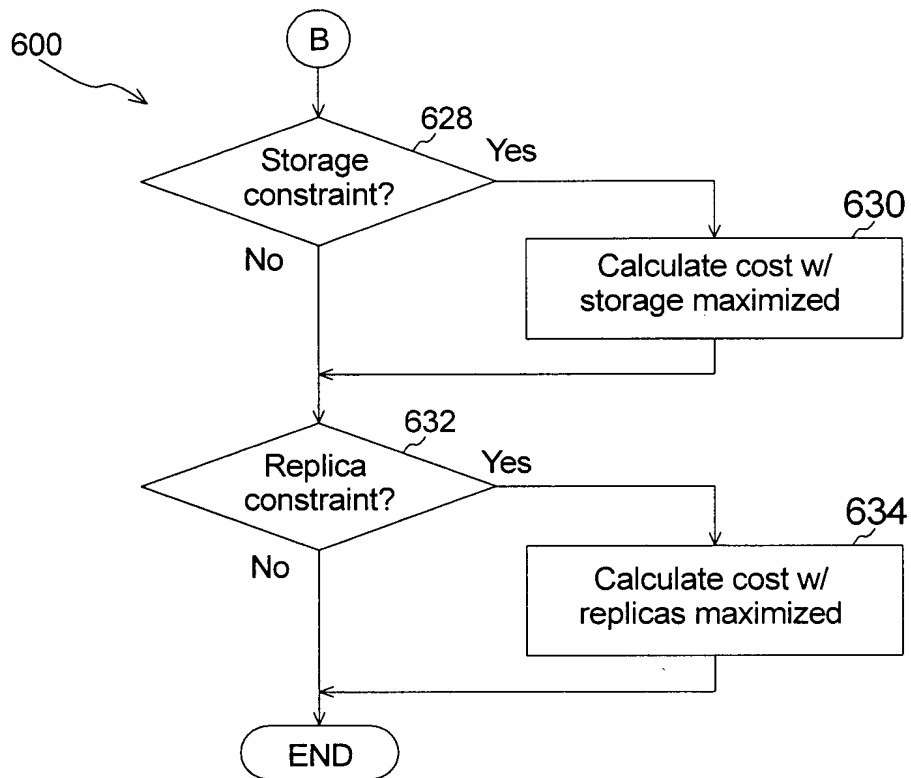


FIG. 6B

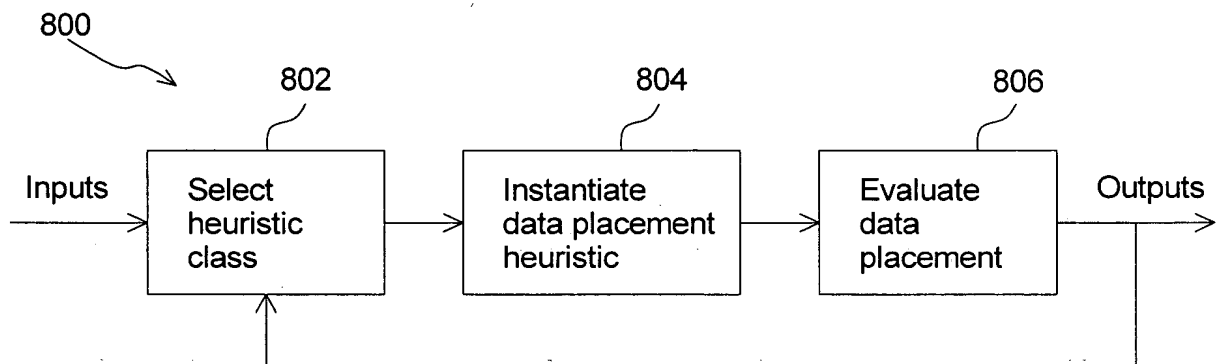


FIG. 8

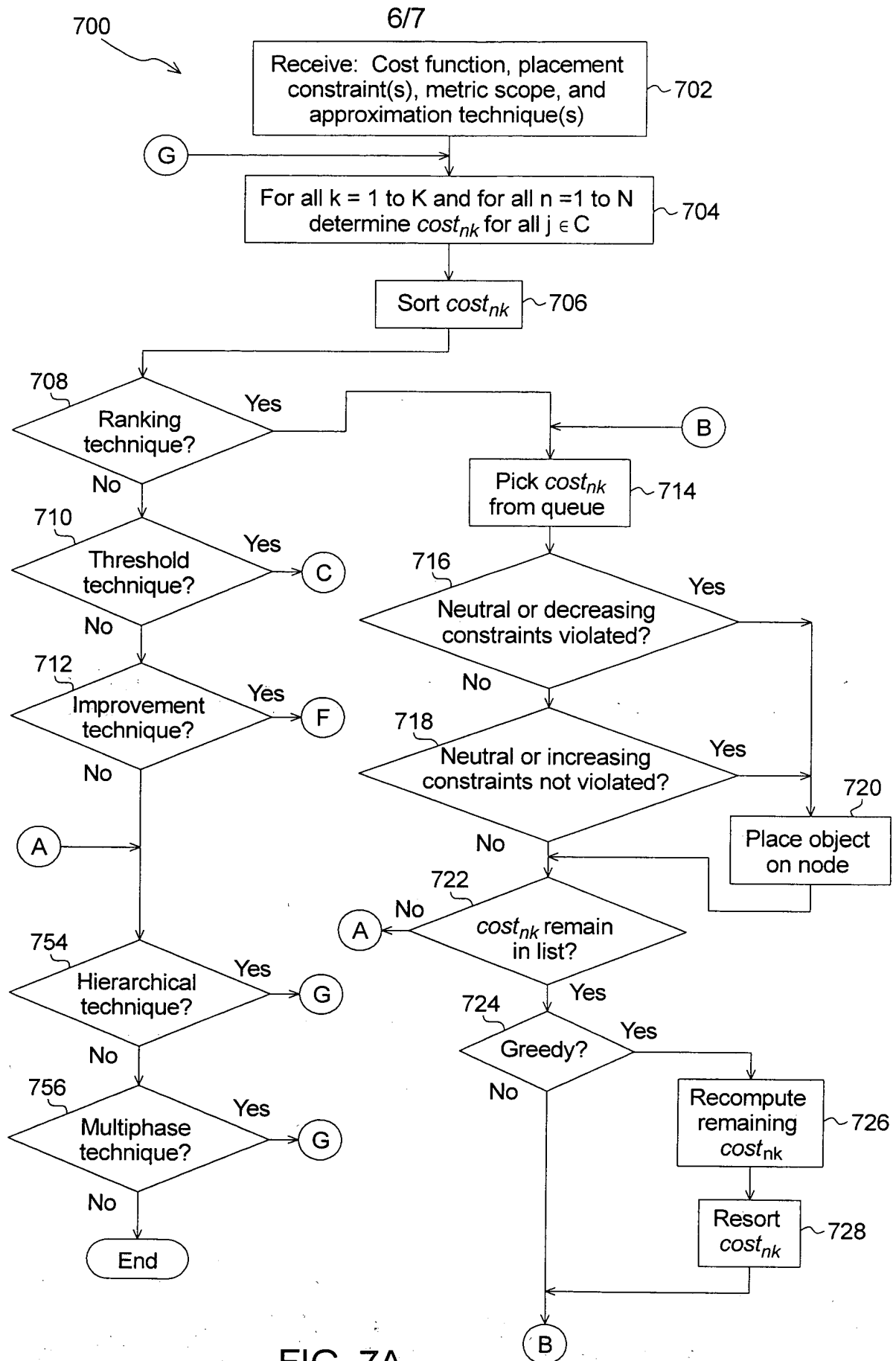


FIG. 7A

